Announcements

- FINAL EXAM:
  - PHYS 132-001: Wednesday, May 10 @ 10-11:50 am

- Office hours…

  F 12-1 pm

- Tutorial Learning Center (TLC) hours:

  MTWR 8-6 pm

  F 8-11 am, 2-5 pm

  Su 1-5 pm

Outline…

CH 25 – Electric Charges & Forces

- Developing a Charge Model
- Charge
- Insulators & Conductors
- Coulomb's Law
- The Field Model

CH 26 – The Electric Field

- Electric Field Models
- *E*-Field of Multiple Pt. Charges
- *E*-Field of a Continuous Charge Distribution
- *E*-Fields of Rings, Disks, Planes, & Spheres
- The Parallel-Plate Capacitor
- Motion of a Charged Particle in an *E*-Field
- Motion of a Dipole in an *E*-Field

CH 27 – Gauss's Law

- Conductors in Electrostatic Equilibrium

CH 28 – The Electric Potential

- Electric Potential Energy
- The Potential Energy of Point Charges
- The Electric Potential
- The Electric Potential inside a Parallel-Plate Capacitor
- The Electric Potential of a Point Charge
- The Electric Potential of Many Charges

Outline…

CH 29 – Potential & Field

- Connecting Potential and Field
- Sources of Electric Potential
- Finding the *E*-field from the Potential
- A Conductor in Electrostatic Equilibrium
- Capacitance and Capacitors
- The Energy Stored in a Capacitor

CH 30 – Current and Resistance

- The Electron Current
- Creating a Current
- Current and Current Density
- Conductivity and Resistivity
- Resistance and Ohm's Law

CH 31 – Fundamentals of Circuits

- Circuit Elements and Diagrams
- Kirchhoff's Laws and the Basic Circuit
- Energy and Power
- Series Resistors
- Real Batteries
- Parallel Resistors
- Resistor Circuits

Outline…

CH 32 – The B-Field

- Magnetism
- The Discovery of the *B*-Field
- The Source of the *B*-Field: Moving Charges
- The *B*-Field of a Current
- Magnetic Dipoles
- The Magnetic Force on a Moving Charge
- Magnetic Forces on Current-Carrying Wires
- Forces and Torques on Current Loops

CH 33 – Electromagnetic Induction

- Induced Currents
- Motional emf
- Magnetic Flux
- Lenz's Law
- Faraday's Law

CH 34 – Electromagnetic Fields and Waves

- Electromagnetic Waves
- Properties of Electromagnetic Waves
- Polarization

Outline…

CH 20 – Traveling Waves

- EM waves
- Index of Refraction

CH 22 –Wave Optics

- Light and Optics
- The Interference of Light
- Double-Slit Interference
- The Diffraction Grating
- Single-Slit Diffraction

CH 23 – The Ray Model of Light

- Reflection
- Refraction
- Total Internal Reflection
- Image Formation by Refraction
- Color and Dispersion
- Thin Lenses: Ray Tracing
- Thin Lenses: Refraction Theory

Ch. 20

$$v = \lambda f$$

$$n = \frac{c}{v}$$

$$\lambda_{mat} = \frac{\lambda_{vac}}{n}$$

Ch. 22

$$\theta_m = \frac{m\lambda}{d}$$

$$y_m = \frac{m\lambda L}{d}$$

$$\Delta y = \frac{\lambda L}{d}$$

$$I_{double} = 4I\cos^2\left(\frac{\pi d y}{\lambda L}\right)$$

$$d\sin\theta_m = m\lambda$$

$$y_m = L\tan\theta_m$$

$$I_{max} = N^2 I_1$$

$$\theta_p = \frac{p\lambda}{a}$$

$$y_p = \frac{p\lambda L}{a}$$

$$w = \frac{2\lambda L}{a}$$

Ch. 23

$$\theta_i = \theta_R$$

$$n_1\sin\theta_1 = n_2\sin\theta_2$$

$$s' = \frac{n_2}{n_1}s$$

$$I_{scattered} \propto \frac{1}{\lambda^4}$$

$$m = -\frac{s'}{s}$$

$$\frac{n_1}{s} + \frac{n_2}{s'} = \frac{(n_2 - n_1)}{R}$$